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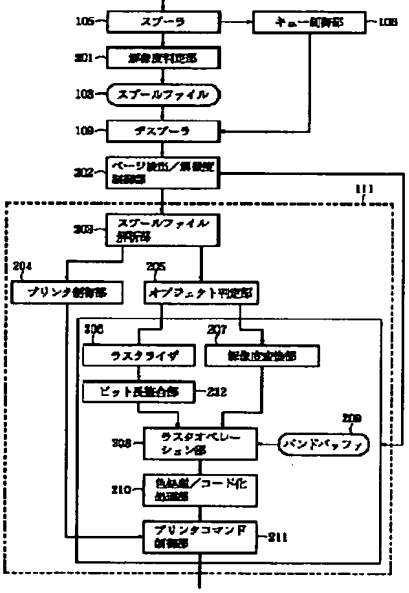
(54) PRINTER CONTROLLER, PRINTER CONTROL METHOD AND STORAGE MEDIUM STORING PROGRAM READABLE BY COMPUTER

(57) Abstract:

PROBLEM TO BE SOLVED: To improve output quality on a printer side by detecting the attributes of the plotting objects of respective pages and switching a resolution mode for performing plotting by a printer driver for the respective pages based on the attributes.

SOLUTION: In the case of judging that a page parameter PP for indicating processing resolution information is set in obtained spool information (an embedding processing after the break of the page by a resolution judgement part 201 is performed), the processing mode is set to the respective parts of the printer driver 111. Then, a page detection / resolution control part 202 changes the processing resolution of a rasterizer 206, a resolution conversion part 207 and a raster operation part 208 corresponding to the processing resolution of the respective pages, shortens the processing bit length of the rasterizer 206 and a bit length matching part 212 and suppresses the increase of processing time accompanying resolution increase. Also, the operation mode of a color processing/coding processing part 210 is switched. Further, the processing resolution of the page and a transfer data resolution are reported to a printer 120.



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(54) **PRINTER CONTROLLER, PRINTER CONTROL METHOD AND STORAGE MEDIUM STORING PROGRAM READABLE BY COMPUTER**

(57)Abstract:
PROBLEM TO BE SOLVED: To improve output quality on a printer side by detecting the attributes of the plotting objects of respective pages and switching a resolution mode for performing plotting by a printer driver for the respective pages based on the attributes.
SOLUTION: In the case of judging that a page parameter PP for indicating processing resolution information is set in obtained spool information (an embedding processing after the break of the page by a resolution judgement part 201 is performed), the processing mode is set to the respective parts of the printer driver 111. Then, a page detection / resolution control part 202 changes the processing resolution of a rasterizer 206, a resolution conversion part 207 and a raster operation part 208 corresponding to the processing resolution of the respective pages, shortens the processing bit length of the rasterizer 206 and a bit length matching part 212 and suppresses the increase of processing time accompanying resolution increase. Also, the operation mode of a color processing/coding processing part 210 is switched. Further, the processing resolution of the page and a transfer data resolution are reported to a printer 120.

CLAIMS

[Claim(s)]
[Claim 1]The printer control device characterized by to have a detection means analyze said print job and detect the attribute of the drawing object of each page in the printer control device which carries out transform processing to the printing control information of different resolution which can process a printer by the printer driver which has a print job containing the drawing object of an attribute which is different from a predetermined application program incorporated, and the control means which switch the resolution mode which said printer driver should draw based on the attribute detected by said detection means for every page.
[Claim 2]The printer control unit according to claim 1 characterized by said control means usually switching the resolution mode which said printer driver should draw to resolution mode when said detection means detects a raster image object as a drawing object.
[Claim 3]The printer control unit according to claim 1 characterized by said control means switching the resolution mode which said printer driver should draw to high resolution mode when said detection means detects except a raster image object as a drawing object.
[Claim 4]In the printer control unit which carries out transform processing to the printing control information of different resolution which can process a printer by the printer driver which has a print job containing the drawing object of an attribute which is different from a predetermined application program incorporatedAn accumulation means to analyze said print job and to accumulate the area of the rasterizing image object of each page, A judgment means to judge whether the area value of the rasterizing image object accumulated by said accumulation means exceeds a predetermined threshold, The printer control unit characterized by having the control means which switches the resolution mode which said printer driver should draw based on the judgment result of said judgment means for every page.
[Claim 5]In the printer control unit which carries out transform processing to the printing control information of different resolution which can process a printer by the printer driver which has a print job containing the drawing object of an attribute which is different from a predetermined application program incorporatedAn accumulation means to analyze said print job and to accumulate the area of the rasterizing image object of each page, An area judging means to judge whether the area value of the rasterizing image object accumulated by said accumulation means exceeds a predetermined threshold, A color judging means by which analyze said print job and the print color of the rasterizing image object of each page judges ******** except a specific color, The printer control unit characterized by having the control means which switches the resolution mode which said printer driver should draw based on each judgment result of said color judging means and said judgment means for every page.
[Claim 6]Said specific color is a printer control unit according to claim 5 characterized by being the same color as the development color of a printer.

[Claim 7]Said control means is a printer control unit given in either of claims 1, 4, and 5 characterized by setting up short the bit length for every pixel of raster processing when resolution mode is switched to high resolution mode.

[Claim 8]The printer control approach characterized by to have the detection process which analyzes said print job and detects the attribute of the drawing object of each page in the printer control approach which carries out transform processing of the print job containing the drawing object of an attribute which is different from a predetermined application program by the printer driver to the printing control information of different resolution which can process a

printer, and the change process which switch the resolution mode which said printer driver should draw based on the this detected attribute for every page.

[Claim 9]In the storage which stored the program which the computer which controls the printer driver which carries out transform processing of the print job containing the drawing object of an attribute which is different from a predetermined application program to the printing control information of different resolution which can process a printer can readThe detection process which analyzes said print job and detects the attribute of the drawing object of each page, The storage characterized by storing the program including the change process which switches the resolution mode which said printer driver should draw based on the detected this attribute for every page which a computer can read.

[Claim 10]In the printer control approach which carries out transform processing of the print job containing the drawing object of an attribute which is different from a predetermined application program to the printing control information of different resolution which can process a printer by the printer driverThe accumulation process which analyzes said print job and accumulates the area of the rasterizing image object of each page, The judgment process which judges whether the area value of the accumulated this rasterizing image object exceeds a predetermined threshold, The printer control approach characterized by having the change process which switches the resolution mode which said printer driver should draw based on this judgment result for every page.
[Claim 11]In the storage which stored the program which the computer which controls the printer driver which carries out transform processing of the print job containing the drawing object of an attribute which is different from a predetermined application program to the printing control information of different resolution which can process a printer can readThe accumulation process which analyzes said print job and accumulates the area of the rasterizing image object of each page, The judgment process which judges whether the area value of the accumulated this rasterizing image object exceeds a predetermined threshold, The storage characterized by storing the program including the change process which switches the resolution mode which said printer driver should draw based on this judgment result for every page which a computer can read.
[Claim 12]In the printer control approach which carries out transform processing of the print job containing the drawing object of an attribute which is different from a predetermined application program to the printing control information of different resolution which can process a printer by the printer driverThe accumulation process which analyzes said print job and accumulates the area of the rasterizing image object of each page, The 1st judgment process which judges whether the area value of the accumulated this rasterizing image object exceeds a predetermined threshold, The 2nd judgment process that analyze said print job and the print color of the rasterizing image object of each page judges ******** except a specific color, every -- the printer control unit characterized by having the change process which switches the resolution mode which said printer driver should draw based on each judgment result of the 1st and 2nd judgment process for every page.
[Claim 13]In the storage which stored the program which the computer which controls the printer driver which carries out transform processing of the print job containing the drawing object of an attribute which is different from a predetermined application program to the printing control information of different resolution which can process a printer can readThe accumulation process which analyzes said print job and accumulates the area of the rasterizing image object of each page, The 1st judgment process which judges whether the area value of the accumulated this rasterizing image object exceeds a predetermined threshold, The 2nd judgment process that analyze said print job and the print color of the rasterizing image object of each page judges ******** except a specific color, every -- the storage characterized by storing the program including the change process which switches the resolution mode which said

printer driver should draw based on each judgment result of the 1st and 2nd judgment process for every page which a computer can read.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to the storage which stored the program which the printer control unit, the printer control approach, and computer which carry out transform processing of the drawing object generated by the application program to the printed information which a printer can print can read.
[0002]
[Description of the Prior Art]Drawing 10 is a block diagram explaining the configuration of this kind of printing control system, and consists of printer 102 grades as a source of an output with the host (PC) 101 as a source of data.

[0003]In drawing, an application program 103 passes the generated print job data to the drawing control system 104 one by one. The drawing control system 104 changes print job data into the data of the format which can carry out drawing processing of the printer driver 111, and passes them to a spooler 105. This data consists of drawing control information over a logical drawing object and a logical printer 102. In addition, the drawing control system 104 is usually the program of a system level, for example, GDI is equivalent to this in Windows (Windows (trade name)).
[0004]A spooler 105 notifies the completion of a spool to the queue control section 106, and makes queuing processing of a print job perform while it sets the output of the drawing control system 104 to a spool file 108.
[0005]The queue control section 106 manages the order of activation of print processing per print job. The notice of the purport which set the print job to the spool file 108 from the spooler 105 is registered into reception, and the print job is registered into a print queue. Moreover, De Dis Pula 109 is started and the output of a print job is usually performed from the head (oldest print job) of a queue.
[0006]De Dis Pula 109 takes out the spool file of the print job directed to the queue control section 106, and passes it to a printer driver 111.
[0007]A printer driver 111 carries out transform processing of the drawing control information over the logical drawing object and logical printer 102 which the drawing control system 104 generated to the physical drawing information and control information which can recognize a printer 102, and transmits to a printer 102 through the I/O-hardware-control section 112.
[0008]The I/O-hardware-control section 112 performs the data buffer ring for transmitting the data stream which the printer driver 111 generated to a printer 102, and I/O hardware control.
[0009]A user interface 901 is an interface for a user to direct the mode of operation of a printer driver 111, application opens a dialog box at the time of print processing initiation, and a user usually directs the parameter about driver processing of a mode of operation or others in this.
[0010]Although it was the processing resolution of a printer driver 111, and the resolution with which a printer 102 is equipped here, it was common to have performed driver processing in the resolution of printer engine conventionally.

[0011]However, with high-resolution-izing of printer engine in recent years, in driver processing of resolution as it is, the processing time becomes long, and high-definition printed representation has become difficult by mere high resolution processing by the data which need gradation nature, such as an image data.

[0012]For this reason, it is possible that low resolution processing is performed by raster processing of a driver, and high resolution-ization of printer engine uses a gradation expression effectively by a concentration pattern method etc. with an image data.
[0013]For example, if printer engine is 600dpi, in print job printing of the text for which edge grace is needed, and graphics, it will become possible to perform raster processing of 600dpi, and printing, and for a printer driver to perform raster processing by 300dpi at the print job of the required image data of a gradation expression, and to perform a gradation expression for every 2x2-dot block of printer engine. Under the present circumstances, although raster processing resolution could be switched for every print job by the user interface 901, for every print job, processing resolution and rasterizing bit length are immobilization, and were not able to be switched within the job.

[0014]
[Problem(s) to be Solved by the Invention]By the way, in the above-mentioned conventional example, the data which various kinds of applications generated consisted of two or more drawing objects in the same print job, and each object is equipped with one attribute of an image, graphics, and a text. In this case, the inside of the same job carries out the rendering of the drawing object in the same resolution, respectively, and that expression means (color transform processing, rendering resolution, dot pattern formation) is designed so that balance may be maintained also in which object attribute.
[0015]However, in the conventional example, there was a problem shown in (1) - (3) below.
[0016](1) While the rasterizing processing itself and color transform processing will take time amount if the whole print job is rasterized with high resolution in order to maintain the grace of a text, the amount of the memory used will increase.
[0017](2) If priority is given to processing speed and gradation nature and raster processing is performed with a low resolution, edge grace will fall in a text etc., and a jaggy will be conspicuous.
[0018](3) There are two sorts, the thing (a text, graphics) of resolution serious consideration and the thing of gradation (color expression) serious consideration, in a drawing object, and it becomes difficult to reconcile the expression grace and processing speed in the print job by which they are intermingled.
[0019]The purpose of the 1st invention which was made in order that this invention might cancel the above-mentioned trouble, and relates to this invention - the 13th inventionBy switching and controlling resolution processing of a printer driver according to the attribute of the drawing object of each page in a print jobBy the printer driverThe optimal resolution processing for the attribute of the drawing object of each pageIt is offering the storage which stored the program which a printer control unit, the printer control approach, and a computer compatible in the image output which is performed and can carry out the maximum exertion of the gradation function by the side of a printer, and high definition outputs, such as an alphabetic character and a graphic form, can read.

[0020]
[Means for Solving the Problem]The 1st invention concerning this invention has a detection means analyze said print job and detect the attribute of the drawing object of each page, and the control means which switch the resolution mode which said printer driver should draw based on the attribute detected by said detection means for every page in the printer control device which carries out transform processing to the printing control information of different resolution which can process a printer by the printer driver which has a print job containing the drawing object of an attribute which is different from a predetermined application program incorporated.
[0021]The 2nd invention concerning this invention usually switches the resolution

mode which said printer driver should draw [said control means] to resolution mode, when said detection means detects a raster image object as a drawing object.

[0022]The 3rd invention concerning this invention switches the resolution mode which said printer driver should draw [said control means] to high resolution mode, when said detection means detects except a raster image object as a drawing object.

[0023]In the printer control unit which carries out transform processing of the 4th invention concerning this invention to the printing control information of different resolution which can process a printer by the printer driver which has a print job containing the drawing object of an attribute which is different from a predetermined application program incorporatedAn accumulation means to analyze said print job and to accumulate the area of the rasterizing image object of each page, A judgment means to judge whether the area value of the rasterizing image object accumulated by said accumulation means exceeds a predetermined threshold, It has the control means which switches the resolution mode which said printer driver should draw based on the judgment result of said judgment means for every page.

[0024]In the printer control unit which carries out transform processing of the 5th invention concerning this invention to the printing control information of different resolution which can process a printer by the printer driver which has a print job containing the drawing object of an attribute which is different from a predetermined application program incorporatedAn accumulation means to analyze said print job and to accumulate the area of the rasterizing image object of each page, An area judging means to judge whether the area value of the rasterizing image object accumulated by said accumulation means exceeds a predetermined threshold, A color judging means by which analyze said print job and the print color of the rasterizing image object of each page judges ******** except a specific color, It has the control means which switches the resolution mode which said printer driver should draw based on each judgment result of said color judging means and said judgment means for every page.

[0025]The 6th invention concerning this invention makes said specific color the same color as the development color of a printer.

[0026]The 7th invention concerning this invention sets up short the bit length for every pixel of raster processing, when said control means switches resolution mode to high resolution mode.

[0027]The 8th invention concerning this invention has the detection process which analyzes said print job and detects the attribute of the drawing object of each page, and the change process which switch the resolution mode which said printer driver should draw based on the this detected attribute for every page in the printer control approach which carries out transform processing of the print job containing the drawing object of an attribute which is different from a predetermined application program by the printer driver to the printing control information of different resolution which can process a printer.

[0028]The 9th invention concerning this inventionIn the storage which stored the program which the computer which controls the printer driver which carries out transform processing of the print job containing the drawing object of an attribute which is different from a predetermined application program to the printing control information of different resolution which can process a printer can readThe detection process which analyzes said print job and detects the attribute of the drawing object of each page, The program including the change process which switches the resolution mode which said printer driver should draw based on the detected this attribute for every page which a computer can read is stored in a storage.

[0029]In the printer control approach which carries out transform processing of the print job containing the drawing object of the attribute from which the 10th invention concerning this invention differs from a predetermined application program to the printing control information of different resolution which can process a printer by the printer driverThe accumulation process which analyzes

said print job and accumulates the area of the rasterizing image object of each page, It has the judgment process which judges whether the area value of the accumulated this rasterizing image object exceeds a predetermined threshold, and the change process which switches the resolution mode which said printer driver should draw based on this judgment result for every page.
[0030]The 11th invention concerning this inventionIn the storage which stored the program which the computer which controls the printer driver which carries out transform processing of the print job containing the drawing object of an attribute which is different from a predetermined application program to the printing control information of different resolution which can process a printer can readThe accumulation process which analyzes said print job and accumulates the area of the rasterizing image object of each page, The judgment process which judges whether the area value of the accumulated this rasterizing image object exceeds a predetermined threshold, The program including the change process which switches the resolution mode which said printer driver should draw based on this judgment result for every page which a computer can read is stored in a storage.

[0031]In the printer control approach which carries out transform processing of the print job containing the drawing object of the attribute from which the 12th invention concerning this invention differs from a predetermined application program to the printing control information of different resolution which can process a printer by the printer driverThe accumulation process which analyzes said print job and accumulates the area of the rasterizing image object of each page, The 1st judgment process which judges whether the area value of the accumulated this rasterizing image object exceeds a predetermined threshold, The 2nd judgment process that analyze said print job and the print color of the rasterizing image object of each page judges ******** except a specific color, every -- it has the change process which switches the resolution mode which said printer driver should draw based on each judgment result of the 1st and 2nd judgment process for every page.
[0032]The 13th invention concerning this inventionIn the storage which stored the program which the computer which controls the printer driver which carries out transform processing of the print job containing the drawing object of an attribute which is different from a predetermined application program to the printing control information of different resolution which can process a printer can readThe accumulation process which analyzes said print job and accumulates the area of the rasterizing image object of each page, The 1st judgment process which judges whether the area value of the accumulated this rasterizing image object exceeds a predetermined threshold, The 2nd judgment process that analyze said print job and the print color of the rasterizing image object of each page judges ******** except a specific color, every -- the program including the change process which switches the resolution mode which said printer driver should draw based on each judgment result of the 1st and 2nd judgment process for every page which a computer can read is stored in a storage.

[0033]
[Embodiment of the Invention]
The [1st operation gestalt] Drawing 1 is the block diagram showing an example of the data processing system which can apply the printer control device in which the 1st operation gestalt of this invention is shown, and has given the same sign to the same thing as drawing 10, and this data processing system is constituted possible [a communication link] through an interface or a network predetermined in a host (PC) 101 and printer 102 grade.
[0034]In addition, the printer 102 communicated with the host 101 with the predetermined protocol, and printed information is received or it is equipped with the function to transmit the status of the printer engine which is not illustrated to a host 101. Moreover, any, such as an ink jet printer engine and laser beam printer engine, are sufficient as printer engine. In addition, drawing 1 is common in each operation gestalt mentioned later.

[0035]In drawing 1, application software (application) 103 passes the generated print job data to the drawing control system 104 one by one. The drawing control system 104 changes print job data into the format which can carry out drawing processing of the printer driver 111, and passes them to a spooler 105. This data consists of drawing control information over a logical drawing object and a logical printer 102. The drawing control system 104 is usually the program of a system level, for example, GDI is equivalent to this in Windows (trade name).

[0036]A spooler 105 notifies the completion of a spool to the queue control section 106, and makes queuing processing of a print job perform while it sets the output of the drawing control system 104 to a spool file 108 through the page parameter judging section 107.
[0037]The page parameter judging section 107 carries out the sequential check of the output of a spooler 105, and embeds the parameter (the page parameter PP is called hereafter) which directs drawing control for every page into a spool file 108.
[0038]The queue control section 106 manages the order of activation of print processing per print job. The notice of the purport which set the print job to the spool file 108 from the spooler 105 is registered into reception, and the print job is registered into a print queue. Moreover, De Dis Pula 109 is started and the output of a print job is usually performed from the head (oldest print job) of a queue.
[0039]De Dis Pula 109 takes out the spool file 108 of the print job directed to the queue control section 106, and passes it to the page parameter control section 110. In response, the page parameter control section 110 checks the contents of the print job, while directing drawing according to the drawing directions which the page parameter judging section 107 mentioned above for every page of the job judged, the directions information (page parameter PP) is deleted, and the data of a job are passed to a printer driver 111 one by one.

[0040]Thereby, the data which a printer driver 111 receives become the same as that of what the spooler 105 outputted.
[0041]A printer driver 111 carries out transform processing of the drawing control information over the logical drawing object and logical printer 102 which the drawing control system 104 generated to the physical drawing information and control information which can recognize a printer 102, and transmits to a printer 102 through the I/O-hardware-control section 112. Moreover, the I/O-hardware-control section 112 also performs the data buffer ring for transmitting the data stream which the printer driver 111 generated to a printer 102, and I/O hardware control.
[0042]Hereafter, data processing of a printer driver 111 shown in drawing 1 with reference to drawing 2 is explained.
[0043]Drawing 2 is a block diagram for explaining the data-processing configuration of the printer driver 111 circumference shown in drawing 1, and has given the same sign to the same thing as drawing 1. Hereafter, spooling, queue control, a DESUPU ring, page parameter control, and data processing of a printer driver 111 are explained with reference to drawing 3.
[0044]Drawing 3 is a flow chart which shows an example of the data-processing procedure of a spooler 105 shown in drawing 1. In addition, (1) - (4) shows each step.
[0045]First, a spooler 105 checks whether drawing information was set to the spool file 108, and the queue control section 106 has started to (1) and a degree, (2) and when it judges with having not started, starts the queue control section 106 at a step (3), and progresses to henceforth [a step (4)].

[0046]On the other hand, when it judges with the queue control section 106 having started at the step (2), set complete is notified to the queue control section 106, the print job is registered into a queue, and (4) and processing are ended. In addition, the function of the queue control section 106, a spool file 108, and

De Dis Pula 109 and data processing are the same as drawing 1 described.

[0047]Data processing in case the page parameter PP of the page parameter judging section 107 shown in drawing 1 considers as the processing resolution for every page hereafter is explained.
[0048]In drawing 2, 201 is the resolution judging section, it corresponds to the example of the page parameter judging section 107 shown in drawing 1, carries out the sequential check of the drawing information passed from a spooler 105, judges the processing resolution for every page, and embeds the directions information as a page parameter PP into a spool file 108. If it judges with it being a gradation serious consideration page here, the page parameter PP which makes processing resolution the Normal resolution will be embedded into a spool file 108, and if it judges with it being a resolution serious consideration page, the page parameter PP which makes processing resolution high resolution will be embedded into a spool file 108. Hereafter, with reference to drawing 4, data processing of the resolution judging section 201 shown in drawing 2 is explained.

[0049]Drawing 4 is a flow chart which shows an example of the 1st data processing of the resolution judging section 201 shown in drawing 2. In addition, (1) - (10) shows each step.
[0050]From the spooler 105, the resolution judging section 201 carries out the sequential acquisition of the drawing object, and checks (1) and its attribute (2). And the checked attribute judges whether it is an image object, and (3) and when it judges with the image object having been detected, it considers that the page is "gradation serious consideration", and judges with the Normal resolution processing (4). And (5) which skips a drawing object to the page end (6), And if a page end is detected, it will progress to processing of a step (9).

[0051]When an attribute check is continued on the other hand when it judges that it is not detected by the image object at a step (3), and it reaches to a page end, since (7) and its page consist of only a text and graphics, they consider that it is "resolution serious consideration", and are judged to be high resolution processing (8).
[0052]And processing resolution information (page parameter PP) is set after the page break in a spool file 108 (9). subsequently -- a print job end ******** -- judging -- (10) -- if it becomes NO -- a step (1) -- return -- if it becomes YES, processing will be ended and it will move to judgment processing of the following page.
[0053]In drawing 2, 202 is page detection / resolution control section, and corresponds to the example of the page parameter control section 110 shown in drawing 1.
[0054]Page detection / resolution control section 202 detects the page break of the spool file information passed from De Dis Pula 109, and switches it according to the procedure which the processing resolution directions information for every page of the is taken out, and shows each processing mode in a printer driver 111 in drawing 5.
[0055]Drawing 5 is a flow chart which shows an example of the data-processing procedure of page detection / resolution control section 202 shown in drawing 2. In addition, (1) - (10) shows each step.
[0056]When acquiring spool information and detecting (1) and a page start, first, (2), It judges whether the page parameter PP which acquires spool information and shows processing resolution information in (3) this spool information is set (embedding processing is carried out by the resolution judging section 201 after the page break). Next, (4), When it is judged that processing resolution information is set into this spool information, the processing mode is set to each part of a printer driver 111, the processing resolution information concerned is deleted from (5) and spool information, and it returns to (7) and a step (1).
[0057]On the other hand, when it is judged that processing resolution information

is not set into this spool information at a step (4), it sets to the default mode beforehand decided to be each part of a printer driver 111, and returns to a step (1).
[0058]a ******** [that the spool information acquired at the step (8) is processing resolution information on the other hand when it is judged at a step (2) that it is not immediately after a page start] -- judging -- (8) -- if it becomes YES, return and its information will be deleted to a step (7) noting that it is invalid.
[0059]On the other hand, when it is judged at a step (8) that spool information is not processing resolution information, the acquired spool file information is passed to the spool file analysis section 203 (9). subsequently -- a print job end ******** -- judging -- (10) -- if it becomes NO -- a step (1) -- return -- processing will be ended if it becomes YES.
[0060]The spool file analysis section 203 checks and classifies the contents of a spool file, and distributes them to each processing module according to the category. And if it is printer control information, and it is drawing processing information, it will distribute to the printer control section 204 to the object judging section 205.
[0061]The printer control section 204 is changed into the control information of a concrete printer according to the logical contents of printer control information, through the printer command control section 211, transmits to a printer 102 and controls printer control command. At this time, the printer command control section 211 generates the command which can actually receive a printer 102.
[0062]If a drawing object is vector data, if the object judging section 205 is raster data, it will distribute to the resolution transducer 207 and it will be passed to a rasterizer 206. A rasterizer 206 and the resolution transducer 207 generate the raster data of the resolution transmitted to a printer 102 for every drawing object, and the raster operation section 208 forms an actual drawing image on a band buffer (secured in the memory resource which is not illustrated).

[0063]If the bit length matching section 212 adjusts bit length the whole pixel so that an image data and raster operation may be possible in the bit length of the raster data which the rasterizer 206 generated, and drawing for every band is completed, the drawing image will be changed into the command/data transmitted to a printer by the printer command control section 211 through color processing / coding processing section 210, and will be transmitted to a printer 102.

[0064]Color processing / coding processing section 210 is changed into the code actually sent to a printer 102 while it changes the drawing information on the band buffer 209 which is logical color space information into the physical color space data aligned with the printer engine of a printer 102. gamma conversion, binary-ized processing, compression processing, etc. are included in these processings.
[0065]The printer command control section 211 changes drawing raster data and printer control information into the command which can receive a printer 102, and passes them to the I/O-hardware-control section 112.
[0066]On the other hand, page detection / resolution control section 202 switches the processing bit length of the processing resolution of a rasterizer 206, the resolution transducer 207, and the raster operation section 208, a rasterizer 206, and the bit length matching section 212 according to the processing resolution of each page. In the case of the Normal resolution, processing bit length is shortened, and this suppresses the increment in the processing time accompanying the increment in resolution.
[0067]Moreover, the mode of operation of color processing / coding processing section 210 is switched if needed. Furthermore, a command is published through the printer command control section 211, and the processing resolution of the page and transfer data resolution are notified to a printer 102.
[0068]A printer 102 processes by switching the resolution of processed data

according to this command.
[0069]According to this operation gestalt described above, when the resolution judging section 201 detects a raster image object, the gradation expression of a raster image can be raised by performing the judgment which considers the page as gradation nature serious consideration processing.
[0070]The [2nd operation gestalt] The area of the image object for every page is calculated, and although the case where judged the processing resolution for every page and the directions information was embedded as a page parameter PP into a spool file 108 was explained, when it is more than constant value, you may control by the above-mentioned operation gestalt to judge with it being a gradation serious consideration page. Hereafter, the operation gestalt is explained with reference to drawing 6.
[0071]Drawing 6 is a flow chart which shows an example of the 2nd data processing of the resolution judging section 201 shown in drawing 2. In addition, (1) - (12) shows each step.
[0072]First, the resolution judging section 201 is preceded with new page processing, and initializes image area to "0" (1). Subsequently, a drawing object is acquired from a spooler 105 and (2) and an attribute check are performed (3). Here, when it is judged that it judges whether the acquired drawing object is an image object, and they are (4) and an image object, image area is calculated and the image area in (5) and its page is accumulated (6).
[0073]subsequently, judgment processing of a drawing object -- a page and a ******** [having been made until] -- judging -- (7) -- if it becomes NO, return and the same processing will be repeated to a step (2).
[0074]From a threshold predetermined in a accumulation value when it judges with judgment processing of a drawing object having been made to the page end at a step (7) on the other hand, it judges whether it is size, considers that it is a resolution serious consideration page when it judges with (8) and a accumulation value being below thresholds, judges with high resolution processing, and progresses after (10) and a step (11).
[0075]On the other hand, at a step (8), when it judges that a accumulation value is size from a predetermined threshold, it considers that it is a gradation serious consideration page, and judges with the Normal resolution processing (9). subsequently, after a page break -- processing resolution information -- setting -- (11) and the above-mentioned judgment processing -- a print job and a ******** [having carried out until completion] -- judging -- (12) -- if it becomes NO, the processing same to a step (1) as return will be repeated.
[0076]On the other hand, processing is ended when it judges with having completed the above-mentioned judgment processing to the print job end at the step (12).

[0077]Since the resolution judging section 201 judges by calculating the area sum total of all the image objects for every page according to this operation gestalt described above, the accuracy of a resolution judging can be raised.

[0078]The [3rd operation gestalt] Although the above-mentioned operation gestalt explained the case where judged the processing resolution for every page and the directions information was embedded as a page parameter PP into a spool file 108Although the area of the image object for every **-JI is calculated and being considered as the element of a processing resolution judgingthe -- two -- operation -- a gestalt -- differing -- a threshold -- namely, -- being fixed -- a threshold -- not but -- a user interface -- (-- UI --) -- 901 -- minding -- a user -- having inputted -- a value -- a comparison test -- carrying out -- it -- constant value -- the above -- it is -- a case -- gradation -- serious consideration -- a page -- it is -- ** -- judging -- as -- you may control . Hereafter, the operation gestalt is explained with reference to drawing 7.

[0079]Drawing 7 is a flow chart which shows an example of the 3rd data processing of the resolution judging section 201 shown in drawing 2. In addition, (1) - (14) shows each step.

[0080]First, the resolution judging section 201 is preceded with new page processing, and initializes image area to "0" (1). Subsequently, a drawing object is acquired from a spooler 105 and (2) and an attribute check are performed (3). Here, when it is judged that it judges whether the acquired drawing object is an image object, and they are (4) and an image object, image area is calculated and the image area in (5) and its page is accumulated (6).
[0081]subsequently, judgment processing of a drawing object -- a page and a ******** [having been made until] -- judging -- (7) -- if it becomes NO, return and the same processing will be repeated to a step (2).
[0082]On the other hand, at a step (7), when it judges with judgment processing of a drawing object having been made to the page end, the information which the user set up through the user interface 901 is acquired, and a threshold is determined and set up from (8) and there (9).
[0083]Subsequently, when it judges whether it is size from the threshold in which the accumulation value carried out a user setup and judges with (10) and a accumulation value being below thresholds, it considers that it is a resolution serious consideration page, judges with high resolution processing, and progresses after (12) and a step (13).
[0084]On the other hand, at a step (10), when it judges that a accumulation value is size from a predetermined threshold, it considers that it is a gradation serious consideration page, and judges with the Normal resolution processing (11). subsequently, after a page break -- processing resolution information -- setting -- (13) and the above-mentioned judgment processing -- a print job and a ******** [having carried out until completion] -- judging -- (14) -- if it becomes NO, the processing same to a step (1) as return will be repeated.

[0085]On the other hand, processing is ended when it judges with having completed the above-mentioned judgment processing to the print job end at the step (14).

[0086]In addition, in this operation gestalt, the user input by the user interface 901 is performed, when the print directions from application are usually performed. If it inputs that print jobs are a text and a graphics subject in this, a threshold will be made high, it is made easy to judge to high resolution processing, and if a user inputs that he is an image subject, a threshold will be made low and making gradation serious consideration easy to process will presuppose easily that it is possible.
[0087]According to this operation gestalt described above, in the resolution judging section 201, processing in which a user's intention was made to reflect can be performed.
[0088]The [4th operation gestalt] Although the above-mentioned operation gestalt explained the case where judged the processing resolution for every page and the directions information was embedded as a page parameter PP into a spool file 108Calculate the area of the image object for every page, when it is more than constant value, judge with it being a gradation serious consideration page, and alsoWhen colors other than a specific color exist also in a text and a graphics object, the gradation processing flag mentioned later may be set and you may control to judge with it being a gradation serious consideration page from the set condition of this gradation processing flag. Hereafter, the operation gestalt is explained with reference to drawing 8. In addition, in this operation gestalt, a specific color is a color in which edge formation in the printing resolution of printer engine is possible, when high resolution processing is performed. That is, if it is colors, such as RGB and YMCK, the edge on raster data and dot placing of printer engine are in agreement, edge formation is possible, but if it is the other color, a halftone expression must be carried out by the dot of space top plurality, and edge forming with high resolution will become impossible. That is, it will be said that performing high resolution processing may limit to the drawing object of these specification color.
[0089]Drawing 8 is a flow chart which shows an example of the 4th data processing of the resolution judging section 201 shown in drawing 2. In addition, (1) - (16)

shows each step.
[0090]First, the resolution judging section 201 initializes a gradation processing flag at OFF while it is preceded with new page processing and initializes image area to "0" (1). Subsequently, when acquiring the drawing object from the spooler 105, and the check of (2) and a gradation processing flag is performed, it judges whether a gradation processing flag is ON and it judges with this gradation processing flag being ON, since it is decided that the page concerned is gradation serious consideration, a page and the drawing object of until are skipped (10).
[0091]a ******** [that the attribute of the acquired drawing object is checked and they are (4) and an image on the other hand when it judges with a gradation processing flag being OFF at a step (3)] -- judging -- (5) -- if it becomes YES, the image area in a page will be calculated, (6) and image area will be accumulated, and it will return to (7) and a step (10).
[0092]a ******** [that colors other than a specific color are used for the object concerned on the other hand when it is judged at a step (5) that it is not an image object] -- checking -- (8) -- if used, a gradation processing flag will be set and it will progress to henceforth [(9) and a step (10)].

[0093]subsequently, the judgment processing concerned -- a page and a ******** [having carried out until activation] -- judging -- (10) -- if it becomes NO, the same processing as return will be repeated to a step (2).
[0094]a ******** [that a gradation processing flag is ON at a step (10) on the other hand a page and when it is judged with having carried out until activation] -- checking -- (11) and (15) which will be a gradation serious consideration page if it becomes YES and which are rich, make, judge with the Normal resolution processing, and set processing resolution information after (13) and a page break.
[0095]subsequently, the above processing -- a print job and a ******** [having carried out until activation] -- judging -- (16) -- if it becomes NO, return and the same processing will be repeated to a step (1), and processing will be ended if it becomes YES.
[0096]a ******** [that the accumulation value of an image object is compared with a predetermined threshold and a accumulation value is size from the threshold concerned on the other hand when judged with a gradation processing flag being OFF at a step (11)] -- judging -- (12) -- if it becomes YES, it will be a gradation serious consideration page -- it is rich, it makes, and progresses to a step (13), and the Normal resolution processing is performed.
[0097]On the other hand, when a accumulation value is judged to be below the threshold concerned at a step (12), it considers that it is a resolution serious consideration page, it judges with high resolution processing, and progresses to (14) and a step (15).
[0098]Since it judges in the resolution judging section 201 by calculating the area sum total of all the image objects for every page according to this operation gestalt described above and also uses as a judgment element for the color from which a gradation expression becomes important also in a text and a graphics object to exist, the accuracy of a resolution judging can be raised further.
[0099]Hereafter, correspondence and its operation with each operation gestalt and each means of the 1st - the 7th invention are explained with reference to drawing 1, drawing 2, etc.
[0100]In the printer control unit which carries out transform processing of the 1st invention to the printing control information of different resolution which can process a printer 102 by the printer driver 111 which has a print job containing the drawing object of an attribute which is different from a predetermined application program incorporatedA detection means to analyze said print job and to detect the attribute of the drawing object of each page (page parameter judging section 107), It has the control means (page detection / resolution control section 202) which switches the resolution mode which said

printer driver 111 should draw based on the attribute detected by said detection means for every page. Since page detection / resolution control section 202 switches the resolution mode which said printer driver 111 should draw for every page based on the attribute detected by the page parameter judging section 107 which analyzes said print job and detects the attribute of the drawing object of each pageThe optimal resolution processing for the attribute of the drawing object in the page concerned can be performed for every page, and the output grace by the side of a printer can be improved.

[0101]Since page detection / resolution control section 202 usually switches the resolution mode which said printer driver 111 should draw to resolution mode when the page parameter judging section 107 detects a raster image object as a drawing object, the 2nd invention can hand over the printed information of the optimal resolution for the resolution conversion by the side of a printer to a printer, and can obtain the output which carried out the gradation function of a printer in ********.

[0102]Since page detection / resolution control section 202 switches the resolution mode which said printer driver 111 should draw to high resolution mode when the page parameter judging section 107 detects except a raster image object as a drawing object, the 3rd invention can output efficiently the high alphabetic character of edge grace, a graphic form, etc. in a short time from an airline printer.

[0103]In the printer control unit which carries out transform processing of the 4th invention to the printing control information of different resolution which can process a printer 102 by the printer driver 111 which has a print job containing the drawing object of an attribute which is different from a predetermined application program incorporatedAn accumulation means to analyze said print job and to accumulate the area of the rasterizing image object of each page (this operation gestalt page detection / resolution control section 202), A judgment means to judge whether the area value of the rasterizing image object accumulated by said accumulation means exceeds a predetermined threshold (this operation gestalt page detection / resolution control section 202), It has the control means (this operation gestalt page detection / resolution control section 202) which switches the resolution mode which said printer driver 111 should draw based on the judgment result of said judgment means for every page. Page detection / resolution control section 202 analyzes a print job, and accumulates the area of the rasterizing image object of each page. Since the resolution mode which should judge whether the area value of the accumulated this rasterizing image object exceeds a predetermined threshold, and said printer driver 111 should draw based on this judgment result is switched for every pageThe amount of image datas can obtain relatively the output which thought the gradation expression as important to many pages compared with other amounts of data.

[0104]In the printer control unit which carries out transform processing of the 5th invention to the printing control information of different resolution which can process a printer 102 by the printer driver 111 which has a print job containing the drawing object of an attribute which is different from a predetermined application program incorporatedAn accumulation means to analyze said print job and to accumulate the area of the rasterizing image object of each page (this operation gestalt page detection / resolution control section 202), An area judging means to judge whether the area value of the rasterizing image object accumulated by said accumulation means exceeds a predetermined threshold (this operation gestalt page detection / resolution control section 202), Said print job is analyzed and the print color of the rasterizing image object of each page is a specific color (the 6th invention). let said specific color be the same color as the development color of a printer -- with a color judging means (this operation gestalt page detection / resolution control section 202) to judge whether it is exceptIt has the control means (this operation gestalt page detection / resolution control section 202) which switches the resolution mode which said printer driver 111 should draw based on each judgment result of said

color judging means and said judgment means for every page. Page detection / resolution control section 202 analyzes said print job, and accumulates the area of the rasterizing image object of each page. While judging whether the area value of the accumulated rasterizing image object exceeds a predetermined thresholdSince the resolution mode which said print job should be analyzed, the print color of the rasterizing image object of each page should judge ******** except a specific color, and a printer driver 111 should draw based on each judgment result is switched for every pageWhen the amounts of image datas are many pages relatively compared with other amounts of data, or/and when the output color of an image data is a color accompanied by a gradation expression, the output which thought the gradation expression as important can be obtained.

[0105]Since page detection / resolution control section 202 sets up short the bit length for every pixel of raster processing when it switches resolution mode to high resolution mode, the 7th invention can restrict the resolution transform-processing time amount by the side of a printer, and can obtain a high-definition output.
[0106]Hereafter, correspondence and its operation with this operation gestalt and each process of the 8th - the 13th invention are explained with reference to drawing 3 - drawing 8, etc.
[0107]In the printer control approach which carries out transform processing of the print job containing the drawing object of the attribute from which the 8th invention differs from a predetermined application program to the printing control information of different resolution which can process a printer 102 by the printer driverThe detection process which analyzes said print job and detects the attribute of the drawing object of each page (step [of drawing 4] (1) - (3)), The change process (step [of drawing 4] (4) - (10)) which switches the resolution mode which said printer driver 111 should draw based on the detected this attribute for every page is performed based on the control program memorized by the memory resource of a host computer 101. The optimal resolution processing for the attribute of the drawing object in the page concerned can be performed for every page, and the output grace by the side of a printer can be improved.

[0108]The 9th inventionThe program which the computer which controls the printer driver 111 which carries out transform processing of the print job containing the drawing object of an attribute which is different from a predetermined application program to the printing control information of different resolution which can process a printer 102 can readThe detection process which analyzes said print job and detects the attribute of the drawing object of each page in the stored storage (step [of drawing 4] (1) - (3)), The program including the change process (step [of drawing 4] (4) - (10)) which switches the resolution mode which said printer driver 111 should draw based on the detected this attribute for every page which a computer can read is stored in a storage. That is, the gestalt which a host's 101 CPU reads and is performed from the storage which was made to memorize the program code corresponding to the process shown in the memory resource which a host computer 101 does not illustrate at drawing 4, and memorized this program code is also included in the operation gestalt of this invention.
[0109]In the printer control approach which carries out transform processing of the print job printer driver containing the drawing object of the attribute from which the 10th invention differs from a predetermined application program to the printing control information of different resolution which can process a printer 102The accumulation process which analyzes said print job and accumulates the area of the rasterizing image object of each page (step [of drawing 6] (1) - (7)), The judgment process which judges whether the area value of the accumulated this rasterizing image object exceeds a predetermined threshold (step of drawing 6 (8)), The change process (step [of drawing 6] (9) - (12)) which switches the resolution mode which said printer driver 111 should draw based on this judgment result for every page is performed based on the control program memorized by the

memory resource of a host computer 101. The amount of image datas can obtain relatively the output which thought the gradation expression as important to many pages compared with other amounts of data.

[0110]The 11th inventionThe program which the computer which controls the printer driver 111 which carries out transform processing of the print job containing the drawing object of an attribute which is different from a predetermined application program to the printing control information of different resolution which can process a printer 102 can readThe accumulation process which analyzes said print job and accumulates the area of the rasterizing image object of each page in the stored storage (step [of drawing 6] (1) - (7)), The judgment process which judges whether the area value of the accumulated this rasterizing image object exceeds a predetermined threshold (step of drawing 6 (8)), The program including the change process (step [of drawing 6] (9) - (12)) which switches the resolution mode which said printer driver 111 should draw based on this judgment result for every page which a computer can read is stored in a storage. That is, the gestalt which a host's 101 CPU reads and is performed from the storage which was made to memorize the program code corresponding to the process shown in the memory resource which a host computer 101 does not illustrate at drawing 6, and memorized this program code is also included in the operation gestalt of this invention.

[0111]In the printer control approach which carries out transform processing of the print job containing the drawing object of the attribute from which the 12th invention differs from a predetermined application program to the printing control information of different resolution which can process a printer 102 by the printer driverThe accumulation process which analyzes said print job and accumulates the area of the rasterizing image object of each page (step [of drawing 8] (4) - (7)), The 1st judgment process which judges whether the area value of the accumulated this rasterizing image object exceeds a predetermined threshold (step of drawing 8 (12)), The 2nd judgment process that analyze said print job and the print color of the rasterizing image object of each page judges ******** except a specific color (step of drawing 8 (8)), every -- the change process (the step (13) of drawing 8 --) which switches the resolution mode which said printer driver 111 should draw based on each judgment result of the 1st and 2nd judgment process for every page(14) is performed based on the control program memorized by the memory resource of a host computer 101. When the amounts of image datas are many pages relatively compared with other amounts of data, or/and when the output color of an image data is a color accompanied by a gradation expression, the output which thought the gradation expression as important can be obtained.

[0112]The 13th inventionThe program which the computer which controls the printer driver 111 which carries out transform processing of the print job containing the drawing object of an attribute which is different from a predetermined application program to the printing control information of different resolution which can process a printer 102 can readThe accumulation process which analyzes said print job and accumulates the area of the rasterizing image object of each page in the stored storage (step [of drawing 8] (4) - (7)), The 1st judgment process which judges whether the area value of the accumulated this rasterizing image object exceeds a predetermined threshold (step of drawing 8 (12)), The 2nd judgment process that analyze said print job and the print color of the rasterizing image object of each page judges ******** except a specific color (step of drawing 8 (8)), every -- the change process (the step (13) of drawing 8 --) which switches the resolution mode which said printer driver 111 should draw based on each judgment result of the 1st and 2nd judgment process for every pageThe program containing (14) which a computer can read is stored in a storage. That is, the gestalt which a host's 101 CPU reads and is performed from the storage which was made to memorize the program code corresponding to the process shown in the memory resource which a host computer 101 does not illustrate at drawing 8, and memorized this program code is also included in the operation gestalt of this invention.

[0113]The data processing system hereafter applied to this invention with reference to the memory map shown in drawing 9 explains the configuration of the data-processing program which can be read.
[0114]Drawing 9 is drawing explaining the memory map of the storage which stores the various data-processing programs which can be read with the data processing system concerning this invention.
[0115]In addition, although it does not illustrate especially, the information for which the information which manages the program group memorized by the storage, for example, version information, an implementer, etc. are memorized, and it depends on OS by the side of program read-out etc., for example, the icon which indicates the program by discernment, may be memorized.

[0116]Furthermore, the data subordinate to various programs are also managed to the above-mentioned directory. Moreover, the program for installing various programs in a computer, the program thawed when the program to install is compressed may be memorized.
[0117]The function shown in drawing 3 in this operation gestalt - drawing 8 may be carried out with the host computer by the program installed from the outside. And this invention is applied even when the information group which includes a program from an external storage is supplied by the output unit through storages, such as CD-ROM, a flash memory, and FD, or a network in that case.
[0118]As mentioned above, it cannot be overemphasized by supplying the storage which recorded the program code of the software which realizes the function of the operation gestalt mentioned above to a system or equipment, and carrying out read-out activation of the program code with which the computer (or CPU and MPU) of the system or equipment was stored in the storage that the purpose of this invention is attained.
[0119]In this case, the program code itself read from the storage will realize the new function of this invention, and the storage which memorized that program code will constitute this invention.
[0120]As a storage for supplying a program code, a floppy disk, a hard disk, an optical disk, a magneto-optic disk, CD-ROM, CD-R, a magnetic tape, the memory card of a non-volatile, ROM, EEPROM, etc. can be used, for example.

[0121]Moreover, it cannot be overemphasized that it is contained also when the function of the operation gestalt which performed a part or all of processing that OS (operating system) which is working on a computer is actual, based on directions of the program code, and the function of the operation gestalt mentioned above by performing the program code which the computer read is not only realized, but was mentioned above by the processing is realized.

[0122]Furthermore, after the program code read from a storage is written in the memory with which the functional expansion unit connected to the functional add-in board inserted in the computer or a computer is equipped, it cannot be overemphasized that it is contained also when the function of the operation gestalt which performed a part or all of processing that CPU with which the functional add-in board and functional expansion unit are equipped based on directions of the program code is actual, and mentioned above by the processing is realized.
[0123]According to each above-mentioned operation gestalt, also in the interior of the same print job, processing of a printer driver can be switched so that the expression grace and processing speed of a printing result may optimize according to the contents of drawing for every page.
[0124]Moreover, when it is more than area with the fixed raster image in a page, it can consider that the page is an image subject's gradation nature serious consideration page, and printer driver processing can be switched so that a multi-tone expression may be performed.
[0125]Furthermore, it can consider that each page is multiple color or a halftone **** gradation nature serious consideration page, and printer driver processing

can be switched so that a multi-tone expression may be performed.

[0126]Moreover, while being able to switch processing at high resolution in the case of a resolution serious consideration page, bit length for every pixel of raster processing can be lessened.
[0127]
[Effect of the Invention]Since a control means switches the resolution mode which said printer driver should draw for every page based on the attribute detected by detection means to analyze said print job and to detect the attribute of the drawing object of each page according to the 1st invention concerning this invention as explained above, the optimal resolution processing for the attribute of the drawing object in the page concerned can be performed for every page, and the output grace by the side of a printer can be improved.
[0128]Since according to the 2nd invention said control means usually switches the resolution mode which said printer driver should draw to resolution mode when said detection means detects a raster image object as a drawing object, the printed information of the optimal resolution for the resolution conversion by the side of a printer can be handed over to a printer, and the output which carried out the gradation function of a printer in ******** can be obtained.

[0129]Since according to the 3rd invention said control means switches the resolution mode which said printer driver should draw to high resolution mode when a detection means detects except a raster image object as a drawing object, the high alphabetic character of edge grace, a graphic form, etc. can be outputted with sufficient high rate in a short time from an airline printer.

[0130]A judgment means judges whether according to the 4th invention, the area value of the rasterizing image object accumulated by accumulation means to analyze a print job and to accumulate the area of the rasterizing image object of each page exceeds a predetermined threshold. Since a control means switches the resolution mode which said printer driver should draw for every page based on this judgment result, the amount of image datas can obtain relatively the output which thought the gradation expression as important to many pages compared with other amounts of data.
[0131]While an area judging means judges whether the area value of the rasterizing image object accumulated by accumulation means to analyze said print job and to accumulate the area of the rasterizing image object of each page exceeds a predetermined threshold according to the 5th and 6th inventionBy analyzing said print job, when a color judging means judges ******** except a specific color, the print color of the rasterizing image object of each pageSince a control means switches the resolution mode which said printer driver should draw for every page based on each judgment resultWhen the amounts of image datas are many pages relatively compared with other amounts of data, or/and when the output color of an image data is a color accompanied by a gradation expression, the output which thought the gradation expression as important can be obtained.

[0132]According to the 7th invention, since the bit length for every pixel of raster processing is short set up when resolution mode is switched to high resolution mode, said control means can restrict the resolution transform-processing time amount by the side of a printer, and can obtain a high-definition output.
[0133]Since the resolution mode which should analyze said print job, and should detect the attribute of the drawing object of each page, and said printer driver should draw based on the this detected attribute is switched for every page according to the 8th and 9th invention, the optimal resolution processing for the attribute of the drawing object in the page concerned can be performed for every page, and the output grace by the side of a printer can be improved.

[0134]According to the 10th and 11th invention, analyze said print job and the

area of the rasterizing image object of each page is accumulated. Since the resolution mode which should judge whether the area value of the accumulated this rasterizing image object exceeds a predetermined threshold, and said printer driver should draw based on this judgment result is switched for every pageThe amount of image datas can obtain relatively the output which thought the gradation expression as important to many pages compared with other amounts of data.

[0135]According to the 12th and 13th invention, analyze said print job and the area of the rasterizing image object of each page is accumulated. While judging whether the area value of the accumulated this rasterizing image object exceeds a predetermined thresholdSince the resolution mode which said print job should be analyzed, the print color of the rasterizing image object of each page should judge ******** except a specific color, and said printer driver should draw based on each judgment result is switched for every pageWhen the amounts of image datas are many pages relatively compared with other amounts of data, or/and when the output color of an image data is a color accompanied by a gradation expression, the output which thought the gradation expression as important can be obtained.

[0136]Therefore, effectiveness compatible in the image output which is made to perform the optimal resolution processing for the attribute of the drawing object of each page by the printer driver, and can carry out the maximum exertion of the gradation function by the side of a printer, and high definition outputs, such as an alphabetic character and a graphic form, is done so.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]It is the block diagram showing an example of the data processing system which can apply the printer control device in which the 1st operation gestalt of this invention is shown.

[Drawing 2]It is a block diagram for explaining the data-processing configuration of the printer driver circumference shown in drawing 1.

[Drawing 3]It is the flow chart which shows an example of the data-processing procedure of a spooler shown in drawing 1.

[Drawing 4]It is the flow chart which shows an example of the 1st data processing of the resolution judging section shown in drawing 2.

[Drawing 5]It is the flow chart which shows an example of the data-processing procedure of page detection / resolution control section shown in drawing 2.

[Drawing 6]It is the flow chart which shows an example of the 2nd data processing of the resolution judging section shown in drawing 2.

[Drawing 7]It is the flow chart which shows an example of the 3rd data processing of the resolution judging section shown in drawing 2.

[Drawing 8]It is the flow chart which shows an example of the 4th data processing of the resolution judging section shown in drawing 2.

[Drawing 9]It is drawing explaining the memory map of the storage which stores the various data-processing programs which can be read with the data processing system concerning this invention.

[Drawing 10]It is a block diagram explaining the configuration of this kind of printing control system.

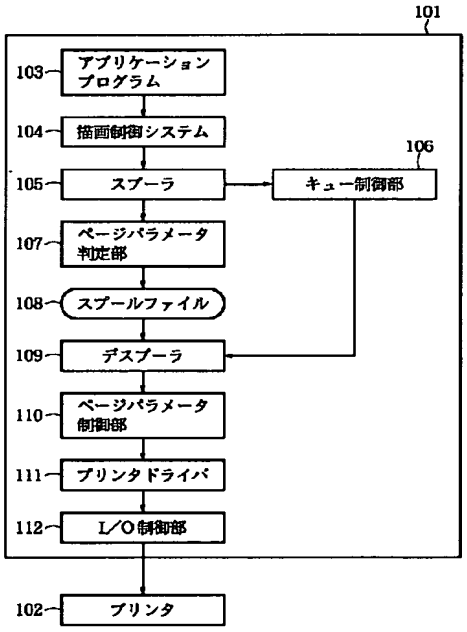
[Description of Notations]

101 Host
102 Printer
103 Application Program
104 Drawing Control System
105 Spooler
106 Queue Control Section

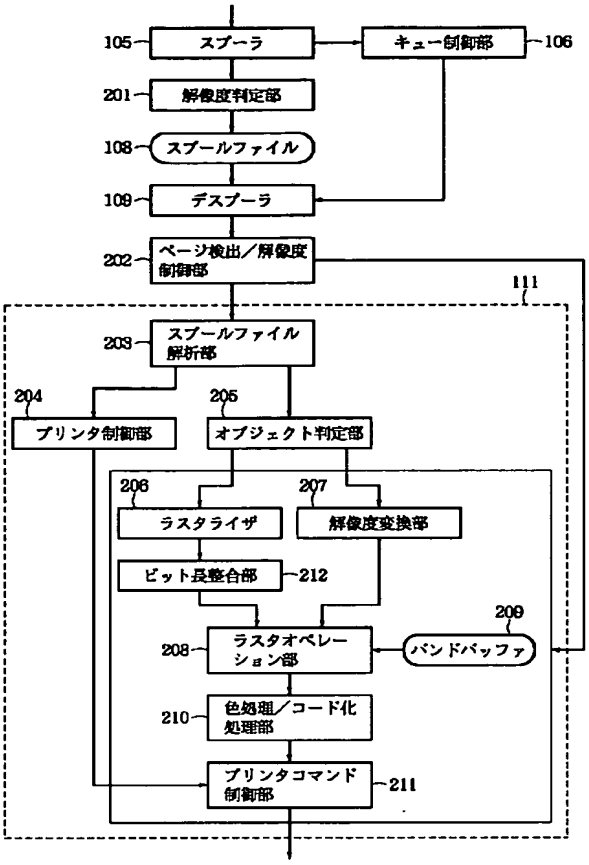
107 Page Parameter Judging Section
108 Spool File
109 De Dis Pula
110 Page Parameter Control Section
111 Printer Driver
112 I/O-Hardware-Control Section
201 Resolution Judging Section
202 It is Control Section Page Detection / whenever [Hierarchy].
203 Spool File Analysis Section
204 Printer Control Section
205 Object Judging Section
206 Rasterizer
207 Resolution Transducer
208 Raster Operation Section
209 Band Buffer
210 Color Processing / Coding Processing Section
211 Printer Command Control Section

DRAWINGS

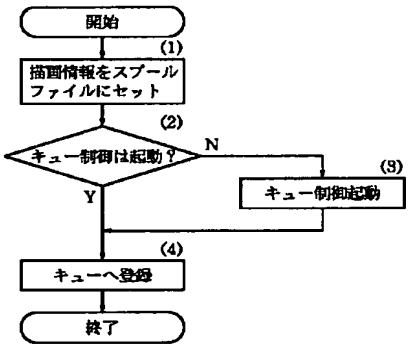
[Drawing 1]



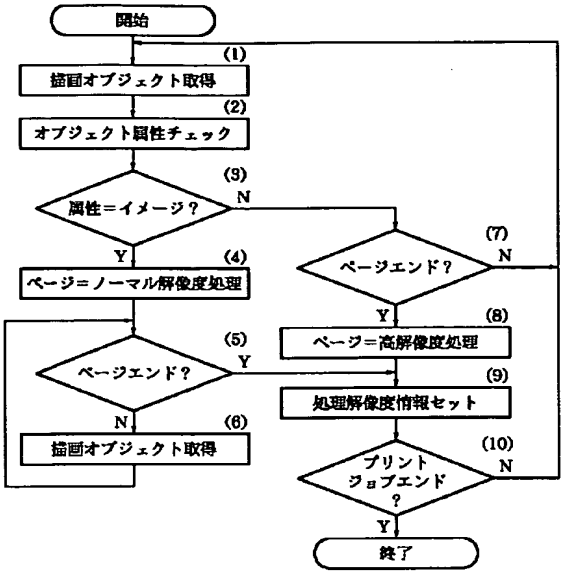
[Drawing 2]



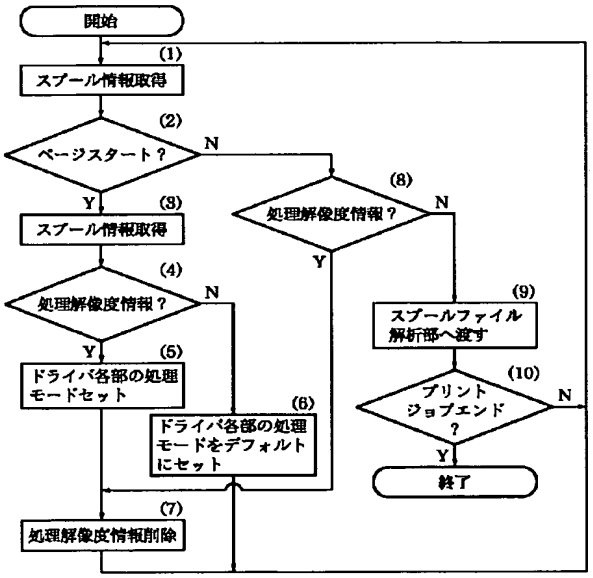
[Drawing 3]



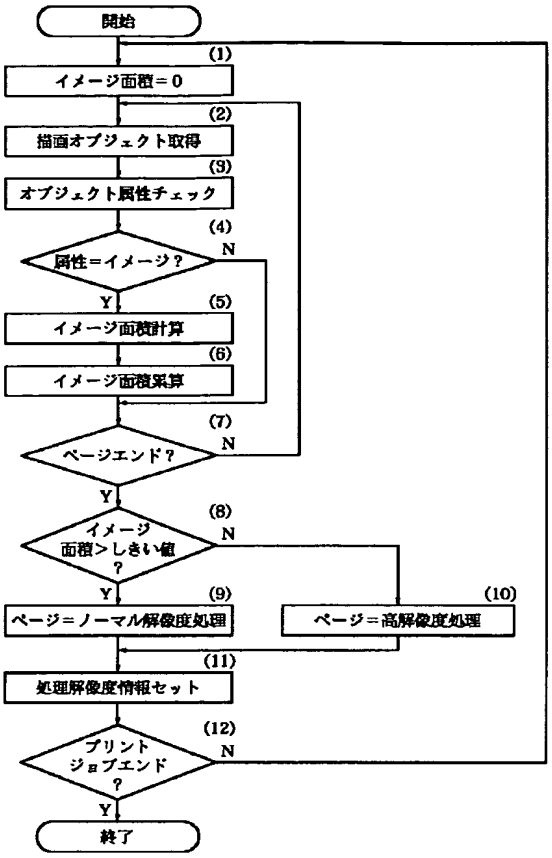
[Drawing 4]



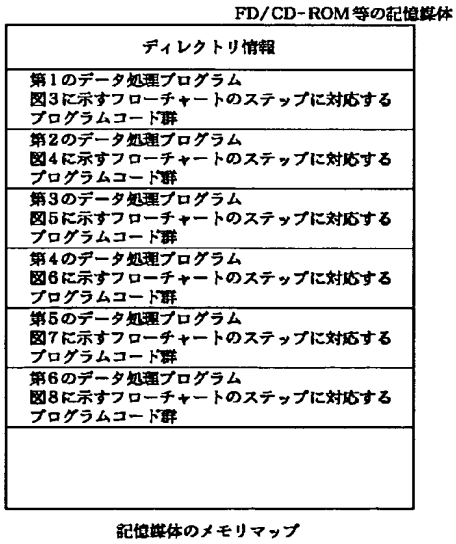
[Drawing 5]



[Drawing 6]

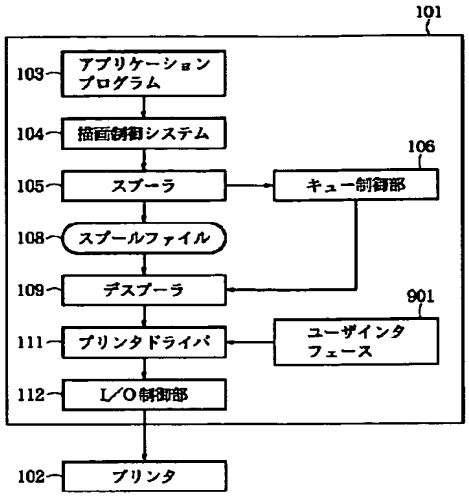


[Drawing 9]

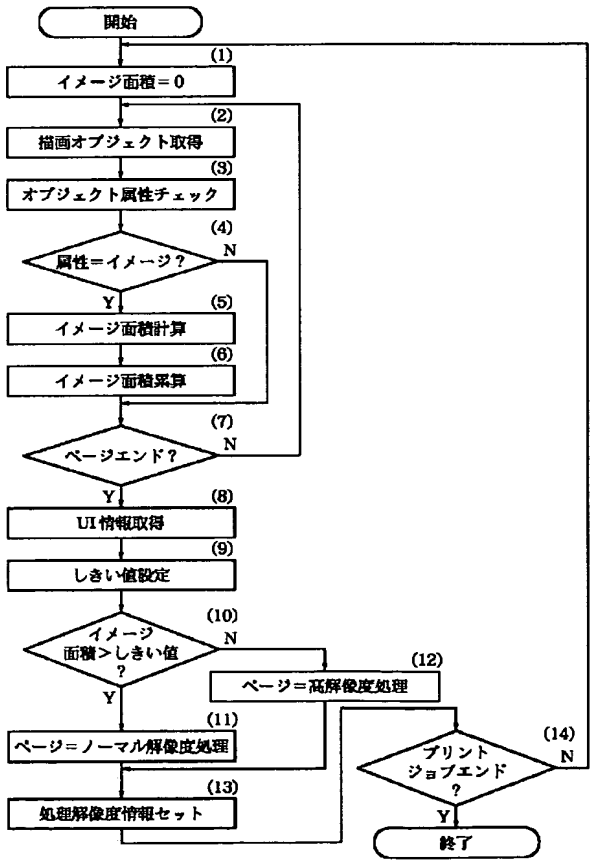


記憶媒体のメモリマップ

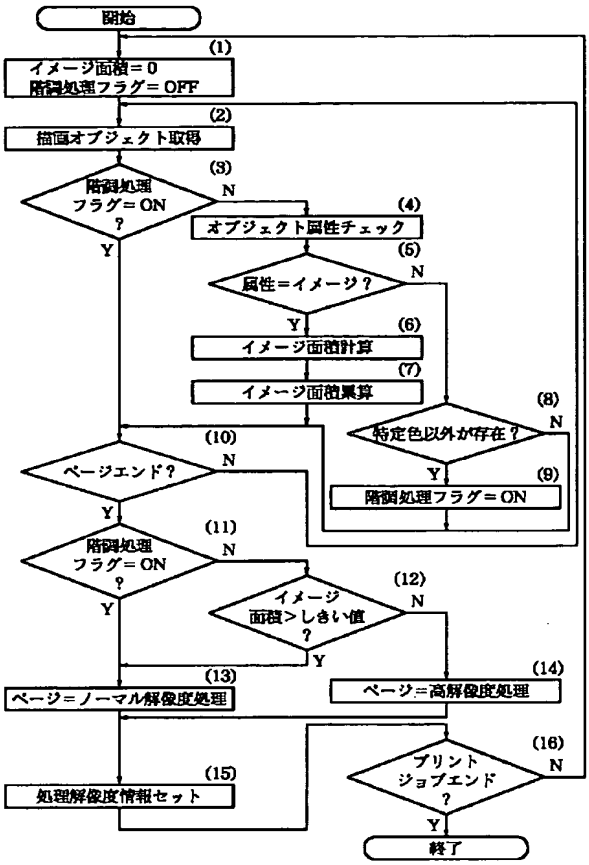
[Drawing 10]



[Drawing 7]



[Drawing 8]


開始
(1)
イメージ面積＝0
階調処理フラグ＝OFF
(2)
描画オブジェクト取得
(3)
階調処理フラグ＝ON？
N
Y
(4)
オブジェクト属性チェック
(5)
属性＝イメージ？
N
Y
(6)
イメージ面積計算
(7)
イメージ面積累算
(8)
特定色以外が存在？
N
Y
(9)
階調処理フラグ＝ON
(10)
ページエンド？
N
Y
(11)
階調処理フラグ＝ON
？
N
Y
(12)
イメージ面積＞しきい値？
N
Y
(13)
ページ＝ノーマル解像度処理
(14)
ページ＝高解像度処理
(15)
処理解像度情報セット
(16)
プリントジョブエンド？
N
Y
終了